REMARKS/ARGUMENTS

Claims 51, 54, 57, 62, 65, 68, and 73-90 were previously pending in the application. Claims 54, 65, 77, and 86 are canceled; and claims 51, 62, 73, and 82 are amended herein. Assuming the entry of this amendment, claims 51, 57, 62, 68, 73-76, 78-85, and 87-90 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

On page 8 of the final office action, the Examiner rejected claims 51, 54, 57, 62, 65, and 68 under 35 U.S.C. 102(e) as being anticipated by Leyendecker. On page 10, the Examiner rejected claims 73-90 under 35 U.S.C. 102(e) as being anticipated by Wright. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over the cited references.

<u>Claims 51 and 62</u>

Claims 51 and 62 have been amended to recite the features recited in previously recited (now canceled) claims 54 and 65, respectively.

As such, currently amended claim 51 is directed to a lineariser for reducing distortion of an output signal of signal handling equipment, by processing a raw signal with data selected from a store in response to the amplitude and frequency content of the raw signal. The store comprises a group of look-up tables, each table corresponding to a component of the raw signal having a different frequency or band of frequencies, and each table comprising a table of coefficients, each coefficient associated with a value of the amplitude of the component of the table.

As explicitly described in the specification of the present application, a raw signal can be divided into a plurality of raw components, each raw component having an amplitude and each raw component corresponding to a different frequency or band of frequencies. For example, in the embodiment shown in Fig. 2, different copies of a raw, I channel input signal are applied to different band-pass filters, each corresponding to a different band of frequencies. As such, the output of each different band-pass filter is a "raw component" signal corresponding to a different band of frequencies. The amplitudes of these different raw component signals are used as indices into a set of LUTs, where each different LUT corresponds to a different band of frequencies, as represented in Fig. 3.

As another example, in the embodiment shown in Fig. 4, the raw, I channel input signal is applied to a fast Fourier transform that converts the time-domain input signal into the frequency domain, where the signal is represented by a plurality of components, each corresponding to a different frequency, where the amplitude of each component is used as the index into a different LUT corresponding to the frequency of that component.

In rejecting previously pending claim 54, the Examiner cited Figs. 8 and 12 and column 14, lines 16-34, of Leyendecker. On page 4, the Examiner stated that "The frequency content of the signal is clearly described in the cited section when [Leyendecker] mentions a predistortion filter, that will be frequency dependent." The Applicant submits that the issue is <u>not</u> whether the <u>signal</u> has "frequency content"; the issue is whether <u>each</u> of a plurality of <u>LUTs</u> corresponds to a <u>different</u> frequency or band of frequencies.

The Examiner stated further on pages 4-5 that "the frequency dependence is expressed as he very well known term 'bin'; also in tables 1-3 it is expressed this dependence and how the LUT table is contracted in function of the bins," citing column 14, line 10, to column 18, line 57. The teachings in

column 14, line 10, to column 18, line 57, relate to a process for updating the values stored in Leyendecker's LUT.

In particular, according to that LUT update process, after interpolating data samples, "trainer **431** then quantizes the samples into 'bins' that are equal in number to the number of table addresses in the predistorter LUT." See column 14, lines 16-18. As known in the art, a bin refers to a specified range of values. In Leyendecker, each bin corresponds to a specific range of amplitude values for the data samples, where a bin value represents the number of data samples that had amplitude values that fell within the range of amplitude values corresponding to that bin. These bin values are then used to update the LUT data.

None of this has anything to do with multiple LUTs corresponding to different frequencies or different bands of frequencies. Leyendecker does not teach or even suggest a plurality of LUTs, where each table corresponds to a component of the raw signal having a different frequency or band of frequencies. Significantly, the bins taught in Leyendecker correspond to different ranges of signal <u>amplitudes</u>, <u>not</u> to different signal <u>frequencies</u>. Moreover, Leyendecker does not teach that the different bins have to have different bin values. For example, there is nothing in the teachings in Leyendecker that would prevent two bins corresponding to different amplitude ranges from having the same value.

For all these reasons, the Applicant submits that currently amended claim 51 is allowable over Leyendecker. For similar reasons, the Applicant submits that currently amended claim 62 is allowable over Leyendecker. Since claims 57 and 68 depend from claims 51 and 62, it is further submitted that those claims are also allowable over Leyendecker.

<u>Claims 57 and 68</u>

According to claims 57 and 68, the raw signal is divided into a number of components having different frequencies or bands of frequencies. In rejecting claim 57, the Examiner cited Fig. 12, block 1201, and column 14, lines 16-34, of Leyendecker. As described in column 14, lines 16-34, solver 1201 quantizes the samples into bins based on the different <u>amplitudes</u> of the samples. Solver 1201 does <u>not</u> divide a raw signal into components having different <u>frequencies</u> or bands of frequencies. The Applicant submits that this provides additional reasons for the allowability of claims 57 and 68 over Leyendecker.

<u>Claims 73 and 82</u>

Claims 73 and 82 have been amended to recite the features recited in previously recited (now canceled) claims 77 and 86, respectively.

As such, currently amended claim 73 is directed to a method for reducing distortion in an output signal generated by signal handling equipment. In particular, a raw signal is divided into a plurality of raw components, each raw component having an amplitude and each raw component corresponding to a different frequency or band of frequencies. A modified component is generated for each raw component based on the amplitude of the raw component <u>by retrieving, for each raw component, a value for the corresponding modified component from a look-up table (LUT) based on the amplitude of the raw component, wherein each different frequency or band of frequencies has its own LUT</u>. The plurality of modified components are combined to generate a modified signal. The Applicant submits that Wright does not teach or even suggest such a combination of features.

The Examiner cited Figs. 15-17 and column 28, line 48, to column 29, line 17 in rejecting previously pending claims 77 and 86. Figs. 15-17 show power amplifier models of progressively

increasing orders of complexity. Each model has an FIR filter 76 and a LUT 78 that stores different sets of coefficients for the FIR filter. In particular, Fig. 15 shows a one-dimensional LUT whose FIR coefficients are accessed using an address derived from the magnitude of the input signal Vm(t). Fig. 16 shows a two-dimensional LUT whose FIR coefficients are accessed using a first address derived from the magnitude of the input signal Vm(t) and a second address derived by differentiating the input signal Vm(t). Lastly, Fig. 17 shows a three-dimensional LUT whose FIR coefficients are accessed using a first address derived from the magnitude of the input signal Vm(t), a second address derived by differentiating the input signal Vm(t), and a third address derived by integrating the input signal Vm(t). According to Wright, the model of Fig. 17 "permits the amplifier's nonlinearity to be characterized as a function of frequency, input signal level, rate of change of envelope and integrated past power profile." See column 29, line 9-13.

Significantly, Wright does not teach dividing a raw signal into a plurality of raw components, where each raw component corresponds to a different frequency or band of frequencies and where a modified component is generated for each raw component based on the amplitude of the raw component by retrieving, for each raw component, a value for the corresponding modified component from a look-up table (LUT) based on the amplitude of the raw component, wherein each different frequency or band of frequencies has its own LUT.

In rejecting previously pending claims 73 and 82, the Examiner cited Wright's Figs. 3 and 8 as showing examples of dividing a raw signal into a plurality of raw components, where each raw component corresponds to a different frequency or band of frequencies.

Wright's Fig. 3 shows one embodiment of digital compensation signal processor (DCSP) 52 having a predistortion FIR filter 52A that filters an input signal Vm(t) based on filter coefficients retrieved from two-dimensional LUT 52H. Wright's Fig. 8 shows an expansion of DCSP 52 having four predistortion FIR filters 52A, each of which filters a different-order multiple of input signal Vm(t) based on filter coefficients retrieved from three-dimensional LUT 52H.

If Wright's Figs. 3 and 8 teach "dividing a raw signal into a plurality of raw components, where each raw component corresponds to a different frequency or band of frequencies," then Wright's "raw components" must be the outputs of the four FIR filters in Fig. 8.

But if those are examples of the raw components of currently amended claims 73 and 82, then Wright fails to teach "generating a modified component for each raw component based on the amplitude of the raw component by retrieving, for each raw component, a value for the corresponding modified component from a look-up table (LUT) based on the amplitude of the raw component, wherein each different frequency or band of frequencies has its own LUT." The only LUT taught by Wright is LUT 52H of Fig. 8, which is analogous to LUTs 78 of Figs. 15-17. Significantly, Wright's "raw components" (i.e., the outputs from the FIR filters) are <u>not</u> used to retrieve values from any LUTs. As such, Wright does not teach or even suggest the features of currently amended claims 73 and 82.

In view of the foregoing, the Applicant submits that currently amended claims 73 and 82 are allowable over Wright. Since new claims 74-76, 78-81, 83-85, and 87-90 depend variously from claims 73 and 82, the Applicant submits that those claims are also allowable over Wright.

The Applicant submits therefore that the rejections of claims under Section 102(e) have been overcome.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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